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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,549	11/24/2003	Shinji Ohuchi	OKI.136D3	1262
20987	7590	02/03/2006	EXAMINER	
			LE, THAO X	
			ART UNIT	PAPER NUMBER
				2814

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/718,549

Applicant(s)

OHUCHI ET AL.

Examiner

Thao X. Le

Art Unit

2814

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --***Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 12 September 2005.  
2a) This action is **FINAL**.                            2b) This action is non-final.  
3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 10-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) Claim(s) \_\_\_\_\_ is/are allowed.  
6) Claim(s) 10-17 is/are rejected.  
7) Claim(s) \_\_\_\_\_ is/are objected to.  
8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
10) The drawing(s) filed on 24 November 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:  
1. Certified copies of the priority documents have been received.  
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) Notice of Informal Patent Application (PTO-152)  
6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Drawings***

1. Figures 9-12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that

the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 10-17 rejected under 35 U.S.C. 103(a) as being unpatentable over US 6297560 to Capote et al. in view of US 6083811 to Riding et al.

Regarding claim 10, Capote discloses a method of mounting a semiconductor device 10 on a mounting substrate that comprises providing the semiconductor device as including a semiconductor element 10, a sealing resin 22 or 37, and a plurality of terminals 14 the semiconductor element having a thickness, a first surface wherein circuitry 24 is formed, a second surface, and side surfaces positioned between the first and second surfaces, the sealing resin (22, 37) having a thickness between about 50 microns and 200 microns, col. 6 lines 40-41 so that the first surface is sealed by the sealing resin 22 or 37 and the second and side surfaces are not sealed by the sealing resin 22 or 37, each of the plurality of terminals 14 being electrically connected to the circuitry 24; putting the semiconductor device on a mounting substrate 20, so that the first surface of the semiconductor device 10 faces the mounting substrate; and fixing

the semiconductor device 10 on the mounting substrate 20 by a heat treatment, col. 7 lines 1-16.

But Capote does not disclose a method wherein the semiconductor element 10 having a thickness of 200 microns or less and the sealing resin having a thickness equal to or greater than half a thickness of the semiconductor element.

However, Riding discloses a method of mounting a semiconductor device on a mounting substrate that comprises providing a semiconductor device 12 as including a semiconductor element 20 having a thickness of 200 p or less, col. 4 lines 10-12 (wherein the dice has a thickness of 4 mils = 102 microns). Accordingly, it would have been obvious to one of ordinary skill in art to use the semiconductor element thickness teaching of Riding with 'Capote's method in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, Zenner (US 6246010) discloses in col. 1 lines 14-20 the chip (semiconductor) having the thickness about 100-200 microns is typical in the art for intended use such as high heat transfer or low profiles.

Regarding claim 11, Capote discloses the semiconductor element has a central portion and a peripheral portion surrounding the central portion, the peripheral portion having a step part 39, wherein a thickness of the sealing resin (22, 37) on the step part 39 is greater than a thickness of the sealing resin on the central portion, fig. 11.

Regarding claims 12, and 13, Capote discloses that the mounting substrate 20 is a printing board, col. 1 lines 63-67.

Regarding claims 14, 15, 16, and 17, Capote discloses that the plurality of terminals are solder balls 14, the heat treatment comprises reflow of solder balls 14.

#### ***Response to Arguments***

5. Applicant's arguments filed 12 Sept. 2005 have been fully considered but they are not persuasive. As discussed in the above claim 10, the thickness of the semiconductor element would have been obvious to one of ordinary skill in art to perform the optimum or workable range by routine experimentation or such thickness would be typical in the art (see Zenner). Furthermore, the applicant has not established the criticality of the thickness stated and since the thickness is in common use in similar devices in the art; it would have been obvious to one of ordinary skill in the art to use these values in the device of the thickness. Where patentability is said to be based upon particular chosen dimension or upon

another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571)

272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thao X. Le  
31 Jan. 2006